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REMARKS

Claims 1-33 are pending in the application. No new matter has been added by way of amendment. As requested by the Examiner, the claims have been amended to incorporate reference to particular SEQ ID NOs to specifically define the first and second nucleotide sequences of the claims. As requested by the Examiner, Applicants are submitting herewith copies of an alignment of second nucleotide sequences of the claims (SEQ ID NO:12 vs. SEQ ID NO:14) showing 41% sequence identity between the sequences and copies of an alignment of first nucleotide sequences of the claims (SEQ ID NO:16 vs. SEQ ID NO:28) showing 74% sequence identity between the sequences. Reexamination and reconsideration of the claims are respectfully requested.

The Invention

The invention relates to compositions and methods for detoxification or degradation of fumonisin or APl. The enzymes and nucleotide sequences of the present invention provide a means for continued catabolism of the fumonisin-degradation products obtained by degradation with other enzymes, such as, for example, previously-described carboxylesterase and amine oxidase enzymes.

As suggested by the Examiner, Applicants have amended the claims so as to define all the nucleotide sequences of the claims in relation to particular sequences disclosed in the specification as SEQ ID NOs. However, Applicants reiterate that they believe that the claims as previously submitted described the invention so as to meet the enablement and written description requirements. The invention involves the use of the novel secondary nucleotide sequences in conjunction with enzymes having fumonisin esterase activity or amine oxidase activity such as those previously described and cited in the specification. Because the enzymes having fumonisin esterase activity or amine oxidase activity were previously described and known in the art, Applicants believe that the description of those sequences as previously claimed met the written description requirement. See, e.g., *Amgen, Inc. v. Hoechst Marion Roussel*, 314 F.3d 1313, 65 USPQ2d 1385 (Fed. Cir. 2003) (noting that the written description

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requirement may be satisfied if the disclosed function is sufficiently correlated to a particular structure known in the art).

Nevertheless, in order to advance prosecution, Applicants have amended the claims as suggested by the Examiner. Applicants therefore respectfully submit that the claims meet the requirements for patentability and should be allowed.

Consideration Of Previously Submitted Information Disclosure Statement

It is noted that initialed copies of the PTO Forms 1449 that were submitted with Applicants' Information Disclosure Statement filed June 15, 2001 and December 11, 2002 have not been returned to Applicants' representative. **ACCORDINGLY, IT IS RESPECTFULLY REQUESTED THAT AN INITIALED COPY OF THESE FORMS 1449 BE FORWARDED TO THE UNDERSIGNED WITH THE NEXT COMMUNICATION FROM THE PTO.** In order to facilitate review of the references by the Examiner, copies of the Information Disclosure Statement and the Forms 1449 are attached hereto. Applicants note that the IDS of June 15, 2001 has been included in mailings to the PTO *three times*. Copies of the cited references were provided at the time of filing the original Information Disclosure Statement, and, therefore, no additional copies of the references are submitted herewith. Applicants will be pleased to provide additional copies of the references upon the Examiner's request if it proves difficult to locate the original references.

CONCLUSION

In view of the above amendments and remarks, Applicants respectfully submit that this application is now in condition for allowance. Early notice to this effect is solicited.

If in the opinion of the Examiner, a telephone conference would expedite the prosecution of the subject Application, the Examiner is invited to call the undersigned.

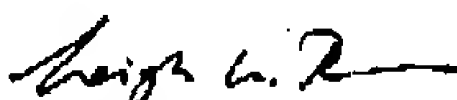
It is not believed that extensions of time or fees for net addition of claims are required, beyond those, which may otherwise be provided for in documents accompanying this paper. However, in the event that additional extensions of time are necessary to allow consideration of

RTA01/2136402v1

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this paper, such extensions are hereby petitioned under 37 CFR § 1.136(a), and any fee required therefore (including fees for net addition of claims) is hereby authorized to be charged to Deposit Account No. 16-0605.

Respectfully submitted,



Leigh W. Thorne
Registration No. 47,992

CUSTOMER NO. 29122
ALSTON & BIRD LLP
Bank of America Plaza
101 South Tryon Street, Suite 4000
Charlotte, NC 28280-4000
Tel Raleigh Office (919) 862-2200
Fax Raleigh Office (919) 862-2260

CERTIFICATION OF FACSIMILE TRANSMISSION

I hereby certify that this paper is being facsimile transmitted to the US Patent and Trademark Office at facsimile number (703) 746-5249 on the date shown below.



Leigh W. Thorne

May 8, 2003
Date

Gap Results

GAP of: SEQ ID NO 14 check: 5189 from: 1 to: 1800
 to: seq id 12 check: 79 from: 1 to: 1936
 Symbol comparison table: nwsgapdna.cmp CompCheck: 8760

Gap Weight: 50 Average Match: 10.000
 Length Weight: 3 Average Mismatch: 0.000

Quality: 6541 Length: 1960
 Ratio: 3.634 Gaps: 10
 Percent Similarity: 40.541 Percent Identity: 40.541

Match display thresholds for the alignment(s):

| = IDENTITY
 : = 5
 . = 1

SEQ ID NO 14 x seq id 12 May 6, 2003 15:05 ..

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1 .....ACT 3
1 GCGGATCCGTTTTTTTTTTTTTTTCTTAAGTTCGACTACCCACTTGCT 50
4 AGTGGATCATTCATTGCTGCGGACTGGCCGCGCCGATAGTCGTTGCGA 53
||| ||| ||| ||| ||| ||| ||| ||| ||| ||| ||| ||| |||
51 AGTCTCACAGTAGCTCCAAGGGTATAAGTTCGACTCGAAGCTGCATCTCT 100
54 TGGTCGCGAGAATAAGCGTGCGAAGTGGGAGGATGTGAAGATGGGGGCCA 103
|| || || || || || || || || || || || || || ||
101 CCGTGAAACATGGCAATAGTTTTTGTAGACAGATCCATCAACCGAGTACA 150
104 GGAGTATGTGTGCGGGACCGTTCCGACGCTTCTGCATTGGCTTGGCTTCA 153
|| || || || || || || || || || || || || || ||
151 CGATGCCGTCAAGGTACATTCTCTCTTGGCTCCTCACCTGCTTTTGGGC 200
154 TCGGTTGCCGTGACTCTAGGGGGAGCCTCCGCCCGCGCGCGCAACCGC 203
|| || || || || || || || || || || || || || ||
201 ATTGCTTTTGGCTCACGATGCGGGTCGTCTGCTCCTACTGTCAAGATTGA 250
204 GACGGATTTTCCGGTCCGCAGGACCGAT.....CTGGGCCAGGTTCA 245
|| || || || || || || || || || || || || || ||
251 TGCTGGGATGGTGGTCCGCACGACTACTACTGTCCCCGGCACCCTGCGA 300
246 GGGACTGGCCCGGGACGTGATGAGCTTTCCGCGAATACCCTATGC....A 291
|| || || || || || || || || || || || || || ||
301 CCGTCAGCGAGTTCTTGGGCGTTCCCTTTTGCGCCTCTCCGACACGATTT 350
292 GCGCCCGCGGTGGGCGGGCTGCGTTGGAAGCGCCCAACACGCCCCGCC 341
|||| || || || || || || || || || || || || || ||
351 GCGCCTCCTACTCGTCCCTGCCCTTGGTCAACGCCTTTGCAAGCCACTGC 400
342 CTGGGCGGGCGTTCCGCCCCGCCACCCAATTTGGCTCCGACTGCTTCGGCC 391

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401 ATATGGTCCAGCATGCCCTCAACAATTCAATTACCCCGAAGAACTCCGTG 450
392CGGCCTATCTTCGCAAAGGCAGCCTCGCCCCCGGCGTGAGC 432
451 ACATTACGATGGCCTGGTTCAATACACCGCCCCCGTCAGCTGGTGAAAGT 500
433 GAGGACTGTCTTTACCTCAACGATGCGGCGCGCTCAGGCGCTAAACCCGG 482
501 GAGGACTGCCTGAACCTCAACATCTACGTCC...CAGGAACTGAGAACAC 547
483 CCAGTACCCCGTCATGGTCTGGGTCTACGGCGGCGGCTTCGCCGCGCGCA 532
548 AAACAAAGCGTCATGGTTTGGATATACGGTGGAGCGCTGGAATATGGTT 597
533 CGGCGCGCATGCCCTACTACGACGGCGAGGCGCT...TGCGCGACAGGGC 579
598 GGAATTCATTCCACCTTTACGACGGGCGCTAGTTTCGCAGCCAATCAGGAT 647
580 CTCGTCGTGGTGACGTTTAACTATCGGACGAACATCCTGGGCTTTTTCGC 629
648 GTCATCGTCGTGACCATCAACTACGAACGAACATTCTGGGCTTCCCTGC 697
630 CCATCCCTGGTCTCTCGCGCGAGAGCCCCACCGGAACTTCGGGCAACTACG 679
698 TGCCCTCAGCT.....TCCAATAACACAGCGAAATCTGG 732
680 GCCTACTCGACATTCCTCGCCGCTCTTCGGTGGGTGCAGAGCAACGCCCCG 729
733 GGTTCCTAGACCAAAGGTTTGGCTTTGGATTGGGTACAGCGGAACATCGCA 782
730 GCCTTCGGAGGGGACCCCCGCGCGAGTGACGGTCTTTGGTGAATCGGCGCG 779
783 GCCTTTGGCGGTGATCCTCGAAAGGTCACAATATTGGGCGAGAGTGCGGG 832
780 AGCGAGCGCGATCGGACTTCTGCTCACCTCGCCGCTGAGCAAGGGTCTCT 829
833 GGGCAGAAGTGTCGACGTCCTCTTGACGCTATGCCACACAACCCACCCT 882
830 TCCGTGGCGCTATCCTCGAAAGTCCAGGGCTGACCGGACCGCTCGCGACG 879
883 TCCGAGCAGCAATCATGGA...GTCCGGTGTGGCTAACTACAACCTTCCCC 929
880 CTCGCGACAGCGCCGCTCGGGCGAGCGCCTCGACGCGGATCTTTCGCG 929
930 AAGGGAGATTGTCCGAACCTTGGAAACACCACTGTTCAAGCTCTCAACTG 979
930 ACTGCGCTCGACCGACCCAGCCACCTGATGGCGCGCGCGGACGCGGCCC 979
980 TACCACCAGTATCGACATCTTGAGTTGTATGAGAAGAGTCCGATCTCGCCA 1029
980 GCCCGGCATCGCGGGACCTGCGCAGGCCGCGTCCGACCGGACCGATCGTC 1029
1030 CTCTGATGAACACGATCGAGCAACTCGGACTTGGGTTTGAATACAGTTG 1079
1030 GATGCGCATGTGCTGCCGCGAGACCGACAGCGCGCGGATCGCGCGGGGCA 1079

1080 GACAACGTAACGGTTGTGTACCGTTCTGAAACGGCTCGCACGACTGGTGA 1129
1080 GCTGGCGCCGGTTCGGGTCTTGATCGGAACCAATGCCGACGAAGGCCCGCG 1129
| | | | | | | | | | | | | | | | | | | | | |
1130 CATTGCTCGTGTACCTGTTCTCGTCGGGACGGTGGCCAACGACGGACTTC 1179
1130 CCTTCCTCGGGCGCGCGCCGATGGAGACGCCAOCGQACTACCAAGCCTAT 1179
| | | | | | | | | | | | | | | | | | | | | |
1180 TCTTTGTCTCTCGGGGAGAATGACACCCCAAGCATATCTCGAGGAGGCAATC 1229
1180 CTGGAGGCGCAGTTTGGCGACCAAGCCGCCCGCGTGGCGGCGTGCTATCC 1229
| | | | | | | | | | | | | | | | | | | | | |
1230 CCGAATCAGCCCCGACCTTTACCAGACTCTCCTTGGAGCATATCCCATTTGG 1279
1230 CCTCGACGGCCGGGCCACGCCCAAGGAAATGQTCCGCGGCATCTTCGGCG 1279
| | | | | | | | | | | | | | | | | | | | | |
1280 ATCCCCAGGGATCGGATCGCCTCAAGATCAGATTGCCGCCATTGAGACCG 1329
1280 ACAATCAGTTCAATCGGGGGTCTCGGCCCTTCTCGGAAGCGCTTGTGCGC 1329
| | | | | | | | | | | | | | | | | | | | | |
1330 AGGTAAGATTCCAGTGTCTTCTGCCATCGTGGCTCAGGACTCCCGGAAT 1379
1330 CAGGGCGCGCCCGTGTGGCCTTATCAGTTCAACGGTAATACCGAGGGTGG 1379
| | | | | | | | | | | | | | | | | | | | | |
1380 CGGGOTATCCCTTCTTGGCGCTACTACTACAATGCCGACCTTTGAGAATCT 1429
1380 AAGAGCGCCGGCTACCCACGGAGCCGAAATTCCTTACGTTTTCGGGGTGT 1429
| | | | | | | | | | | | | | | | | | | | | |
1430 CGAGCTTTTCCCTGGGTCCGAAGTGTACCACAGCTCTGAAGTCGGGATGG 1479
1430 TCAAGCTCGACGAGTTGGGTCTGTTTCAATTGCGCCGCCGAGGGGCCACG 1479
| | | | | | | | | | | | | | | | | | | | | |
1480 T...GTTTGGCACGTATCCTGTGCAAGTGGGACCGCCTTGGAGGCCAG 1526
1480 CCGCCGACCGTGGCTGGGCCAACTGATGTCTCCGCCCTGGGTCC.... 1525
| | | | | | | | | | | | | | | | | | | | | |
1527 ACGAGCAAATACATGACGGGTGCTGGCGCGCCTTTGCCAAAACCCCAT 1576
1526 GGTTCGCCCAAGAAATGGCGACCCCGCCGGGACGCCCTTACCTGGCCTGCC 1575
| | | | | | | | | | | | | | | | | | | | | |
1577 GAATGGCCCTGGGTGGAAACAAGTGGCGAATGTGCGGCGCTTGGCTCAC 1626
1576 TATTCTACGGGCAAGTCGACCATGACATTCCGTCCCGAGGGCCGCGCGGC 1625
| | | | | | | | | | | | | | | | | | | | | |
1627 CAGGCAAAGCCATCCAGGTTGACGTCTCTCCAGCGACAATAGACCAACGA 1676
1626 GGTGGTGTGCGCCCGACCTTCCATCCCCCCTTGCGC.GGATGGCGCCAAG 1674
| | | | | | | | | | | | | | | | | | | | | |
1677 TGTGCCTTGTACACGCATTATTATACTGAGTTGGGCACAATCGCGCCGAG 1726
1675 GCGGGGTGACGCGCTCGACGATGGCGTGACGACGGTCGAGGCGATGTTCT 1724
| | | | | | | | | | | | | | | | | | | | | |
1727 GACATTTTGAGGACCAGGGTATTGTACCTACAGCGGGTTCCGAAAAGGAG 1776
1725 CGATCTGGAGTCCGCGCCGCTCGATTTCGCTCGTCTCCGGCGCTCAGAC 1774
| | | | | | | | | | | | | | | | | | | | | |
1777 GTATCTGCTGTCAATTTGCCGCCAGCCATCATTTGAAGAGTGCTGAAATTT 1826

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P. 014

1775 GAACGCCCCAGTTCCATCCACACAGT..... 1800
| | | | | | | | | |
1827 CATGGGGGAATATCCATCCATGCTCACATTAGCGCTTTTGGAACATGGAC 1876

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Sequences are 16 (Exophiala) and 28 (Rhinocladiella)

414 + 50 = 464 divergent nucleotides in total

seq 28 is 1803 nt long

1803-464 = 1339

1339/1803 = 74.3% identity over the full length of seq id 28.

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1 ATGGCACTTGCACCGAGCTACATCAATCCCCCAAACCTCGCCTCCCCAGC 50
51 AGGGTATTCCACGTCGGCCTAGGCCCAAACGGAGGGAGGTATGCGACAA 100
101 TAGCTGGACAGATTGGACAAGACGCTTCGGCCGTGACAGACCCTGCCTAC 150
151 GAGAAACAGGTTGCCCAAGCATTGCCCAACCTGCGAGCTTGTCTTGCTGC 200
201 AGTTGGAGCCACTTCAAACGACATTACCAAGCTCAATTACTACATCGTCG 250
251 ACTACAACCCGAGCAAACTCACCAGCAATTGGAGATGGGCTGAAGGCTACC 300
301 TTTGCCCTTGACAGGCTCCCTCCTTGACAGCTGGTGGCAATGCCGGCCCT 350
351 GGCTTCACCTGAATACCCCTTTGAGGTTGATGCCACCGCGCTGGTTCCAG 400

1 .....GACAAAGTTGCGGACCTGGTAGTGGTGGGCGCTGGC 36
   |||||:|||||:|||||:|||||:|||||:|||||:|||||:
401 GACACTCAACCCGAGACAATGTTGCGGACGTCGTCGTCGTCGTCGTCGTC 450
   |||||:|||||:|||||:|||||:|||||:|||||:|||||:
37 TTGAGCGGTTTGGAGACGGCACGCAAAGTCCAGGCGCGCGCTCTGTCCTG 86
   |||||:|||||:|||||:|||||:|||||:|||||:|||||:
451 TTGAGCGGTTTGGAGACGGCACGCAAAGTCCAGGCTGCCGCGCTCTGTCCTG 500
   |||||:|||||:|||||:|||||:|||||:|||||:|||||:
87 CCTCGTTCTTGAGGCGATGGATCGTGTAGGGGGAAAGACTCTGAGCGTAC 136
   |||||:|||||:|||||:|||||:|||||:|||||:|||||:
501 CCTCGTTCTTGAGGCGATGGATCGTGTAGGGGGAAAGACTCTGAGCGTAC 550
   |||||:|||||:|||||:|||||:|||||:|||||:|||||:
137 AATCGGGTCCCGGCAGGACGACTATCAACGACCTCGGCGCTGCGTGGATC 186
   |||||:|||||:|||||:|||||:|||||:|||||:|||||:
551 AATCGGGTCCCGGCAGGACGCTATCAATGACCTCGGCGCTGCGTGGATC 600
   |||||:|||||:|||||:|||||:|||||:|||||:|||||:
187 AATGACAGCAACCAAAGCGAAGTATCCAGATTGTTTGAAGATTTCATTT 236
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|||||
601 AATGACAGCAACCAAAGCGAAGTATTCAAATTTATTTGAAAGATTTCAATTT 650
237 GGAGGGCGAGCTCCAGAGGACGACTGGAAATTCATTCATCAAGCACAAAG 286
|||||
651 GGAGGGCGAGCTCCAGAGGACGACCGGAAATTCATTCATCAAGCACAAAG 700
287 ACGGTACAACCACTACAGCTCCTTATGGTGACTCCTTGCTGAGCGAGGAG 336
|||||
701 ACGGTACAACCACTACAGCTCCTTATGGTGATTCCCTGCTGAGCGAGGAG 750
337 GTTGCAAGTGCACTTCCCGAACTCCTCCCCGTATGCTCTCAGCTGATCGA 386
|||||
751 GTTGCAAGTGCACTTCCCGAACTCCTCCCCGTATGCTCTCAGCTGATCGA 800
387 AGAGCATAGCCTTCAAGACCTCAAGCGGAGCCCTCAGGCGAAGCGGCTCG 436
|||||
801 AGAGCATAGCTCTTGAAGACCCCAAGCGGAGCCCTCAAGCGAAGCAGCTCG 850
437 ACAGTGTGAGCTTCCCGCACTACTGTGAGAAGGAAGTAACTTGCTGCT 486
|||||
851 ACAGTGTGAGCTTCCCGCACTACTGTGAGAAGGATCTAAGCTTGCTGCT 900
487 GTTCTCGGCGTAGCAAACCAAGATCACACGCGCTCTGCTCGGTGTGGAAGC 536
|||||
901 GTTCTCGGCGTAGCAAACCAAGATCACACGCGCTCTGCTCGGTGTGGAAGC 950
537 CCACGAGATCAGCATGCTTTTTCTCACCAGCTACATCAAGAGTGCCACCG 586
|||||
951 CCACGAGATCAGCATGCTTTTTCTCACCAGCTACATCAAGAGTGCCACCG 1000
587 GTCTCAGTAATATTTTCTCGGACAAGAAAGACGGCGGGCAGTATATGCGA 636
|||||
1001 GTCTCAGTAATATTTTCTCGGATAAGAAAGACGGTGGGCAGTATATGCGA 1050
637 TGCAAAACAGGTATGCAGTGGATTGCCATGCCATGTCAAAGGAAGTGT 686
|||||
1051 TGCAAAACAGGTATGCAGTGGATTGCCATGCCATGTCAAAGGAAGTGT 1100
687 TCCAGGCTCAGTGACCTCAACACCCCCGTCGCTGAAATTGAGCAGTCGG 736
|||||
1101 TCCAGGCTCAGTGACCTCAACACCCCCGTCGCTGAAATTGAGCAGTCGG 1150
737 CATCCGGCTGTACAGTACGATCGGCTCGGGCGCCGTGTTCGGAAGCAAA 786
|||||
1151 CATCCGGCTGTACAGTACGATCGGCTCGGGCGCCGTGTTCGGAAGTAAA 1200
787 AAGGTGGTGGTTTCGTTACCGACAACCTTGTATCCACCTTGACATTTTC 836
|||||
1201 AAGGTGGTGGTTTCGTTACCGACAACCTTGTATCCACCTTGATATTTTC 1250
837 ACCACCTCTTCCCCCGAGAAGCAAGCATTTGGCGGAAAAATCTATCCTGG 886
|||||
1251 ACCACCTCTTCCCCCGAGAAGCAAGCATTTGGCTGAAAAATCTATCCTGG 1300
887 GCTACTATAGCAAGATAGTCTTCGTATGGGACAAGCCGTGGTGGCGCGAA 936
|||||

1301 GCTACTATAGCAAGATAGTCTTCGTATGGGACAAGCCGTGGTGGCGCGAA 1350
937 CAAGGCTTCTCGGGCGTCCTCCAATCGAGCTGTGACCCCATCTCATTTGC 986
|||||
1351 CAAGGCTTCTCGGGCGTCCTCCAATCGAGCTGTGACCCCATCTCATTTGC 1400
987 CAGAGATACCAGCATCGACGTCGATCGACAATGGTCCATTACCTGTTTCA 1036
|||||
1401 CAGAGATACCAGCATCGAAGTCGATCGGCAATGGTCCATTACCTGTTTCA 1450
1037 TGGTCGGAGACCCGGGACGGAAGTGGTCCCAACAGTCCAAGCAGGTACGA 1086
|||||
1451 TGGTCGGAGACCCGGGACGGAAGTGGTCCCAACAGTCCAAGCAGGTACGA 1500
1087 CAAAAGTCTGTCTGGGACCAACTCCGCGCAGCCTACGAGAACGCCGGGGC 1136
|||
1501 CAGAAATCTGTCTGGAACCAACTCCGCGCAGCCTACGAGAACGCCGGGGC 1550
1137 CCAAGTCCCAGAGCCGGCCAAACGTGCTCGAATCGAGTGGTCCAAGCAGC 1186
|||||
1551 CCAAGTCCCAGAGCCGGCCAAACGTGCTCGAATCGAGTGGTCCAAGCAGC 1600
1187 AGTATTTCCAAGGAGCTCCGAGCGCCGTCTATGGGCTGAACGATCTCATC 1236
|||||
1601 AGTATTTCCAAGGAGCCCGAGCGTCTCTATGGGCTGAACGATCTCAAC 1650
1237 ACACTGGGTTCGGCGCTCAGAACGCCGTTCAAGAGTGTTTCATTTTCGTTGG 1286
|||||
1651 ACACTGGGTTCGGCGCTCAGAACGCCGTTCAAGAGTGTTTCATTTTCGTTGG 1700
1287 AACGGAGACGTCTTTACTTTGCAAAGGGTATATGGAAGGGGCCATACGAT 1336
|||||
1701 AACGGAGACGTCTTTGTTTGGAAAGGGTATATGGAAGGGGCCATACGAT 1750
1337 CGGGTCAACGAGGTGCTGCAGAAGTTGTGGCTAGCCTGGTGCCAGCAGCA 1386
|||||
1751 CCGGTCAGCGAGCGCTGCAGAAGTTGTGGCTAGCCTGGTGCCAGCAGCA 1800
1387 TAG 1389
|||
1801 TAG 1803